

WHAT IS CLAIMED IS:

- 1 1. A circuit board for mounting circuit components, the circuit board
2 comprising:
3 traces of electrically conductive material disposed on at least one side of
4 the circuit board for electrically interconnecting the circuit
5 components mounted on the circuit board; and
6 at least one female interlocking element on at least one edge of the circuit
7 board for interlocking with a male interlocking element of a circuit
8 board connector that connects the circuit board with another circuit
9 board.
- 1 2. The circuit board of claim 1, further comprising:
2 through-holes disposed on the circuit board for mounting through-hole
3 circuit components on the circuit board, the traces electrically
4 interconnecting two or more of the through-hole circuit
5 components.
- 1 3. The circuit board of claim 2, wherein the through-hole circuit component
2 is one selected from the group consisting of a resistor, a capacitor, an inductor, a crystal,
3 a header, a jumper wire, a fuse, a transistor, a voltage regulator, a Dual In-Line package
4 integrated circuit, a Dual In-Line package switch, a relay, an RJ11 connector, an RJ45
5 connector, a drive power connector, a power jack, an ATX power connector, an audio

6 RCA jack, a DB 25 connector, a JTAG connector, an IEEE 1394 Firewire connector, an
7 RGB connector, and a USB connector.

1 4. The circuit board of claim 2, wherein the through-holes are disposed in an
2 array, and the through-holes in a first row of the array are positioned with a
3 predetermined offset in relation to the positions of the through-holes in a second row of
4 the array adjacent to the first row.

1 5. The circuit board of claim 1, further comprising:
2 at least one surface-mount pad disposed on one side of the circuit board
3 for mounting a surface-mount circuit component on the circuit
4 board.

1 6. The circuit board of claim 5, wherein the surface-mount circuit component
2 is one selected from the group consisting of a 6063 package integrated circuit, a 0805
3 package integrated circuit, a CASE-A package integrated circuit, a CASE-B package
4 integrated circuit, a SOD-123 package integrated circuit, a SOT-23 package integrated
5 circuit, a SOT-223 package integrated circuit, a SO package integrated circuit, a SOP
6 package integrated circuit, a QSOP package integrated circuit, a SSOP package
7 integrated circuit, a TSSOP package integrated circuit, a PSSOP package integrated
8 circuit, a QFP package integrated circuit, a TQFP package integrated circuit, a PQFP
9 package integrated circuit, and a PLCC package integrated circuit.

1 7. The circuit board of claim 1, further comprising:

2 at least one surface-mount pad disposed on one side of the circuit board
3 for mounting a surface-mount circuit component on the circuit
4 board; and
5 through-holes disposed on the circuit board for mounting through-hole
6 circuit components on the circuit board, the traces electrically
7 interconnecting two or more of the surface-mount circuit
8 component and the through-hole circuit components.

1 8. The circuit board of claim 7, wherein the traces interconnect the surface-
2 mount circuit component to the outer edges of the circuit board via the through-holes.

1 9. The circuit board of claim 7, wherein an end of the trace is tilted by 45
2 degrees.

1 10. The circuit board of claim 1, comprising four female interlocking elements
2 on each edge of the circuit board, the female interlocking elements for interlocking with
3 corresponding male interlocking elements of the circuit board connector.

1 11. The circuit board of claim 1, wherein a half part of the male interlocking
2 element of the circuit board connector is inserted into the female interlocking element of
3 the circuit board from one side of the circuit board.

1 12. The circuit board of claim 1, wherein the female interlocking element has
2 a shape including a substantially straight portion open at the edge of the circuit board and
3 a substantially rounded portion connected to the straight portion.

1 13. The circuit board of claim 1, wherein the circuit board is connected to
2 another circuit board by a first half part of the male interlocking element of the circuit
3 board connector inserted into the female interlocking element of the circuit board from
4 one side of the circuit board and a second half part of the male interlocking element of
5 the circuit board connector inserted into a female interlocking element of the another
6 circuit board from one side of the another circuit board, to form a larger circuit board.

1 14. A circuit board connector for connecting a first circuit board with a second
2 circuit board, the first circuit board and the second circuit board for mounting circuit
3 components thereon and having at least a first female interlocking element and a second
4 female interlocking element, respectively, the circuit board connector comprising:
5 a body having a cross-section that is rectangular with two parallel edges
6 substantially longer than the other two parallel edges; and
7 at least one male interlocking element connected to the body, a first half
8 part of the male interlocking element capable of being inserted into
9 the first female interlocking element and a second half part of the
10 male interlocking element capable of being inserted into the
11 second female interlocking element to mechanically connect the
12 first and second circuit boards.

1 15. The circuit board connector of claim 14, wherein the first and second half
2 parts of the male interlocking element are capable of being inserted into the first and
3 second female interlocking elements, respectively, from one side of the first and second

4 circuit boards to provide backing support for the mechanically connected first and second
5 circuit boards.

1 16. The circuit board connector of claim 14, comprising four male
2 interlocking elements connected to the body.

1 17. The circuit board connector of claim 14, wherein the male interlocking
2 element includes a first substantially rounded portion, a second substantially rounded
3 portion, and a substantially straight portion between the first and second substantially
4 rounded portions, the first half part of the male interlocking element being comprised of
5 the first substantially rounded portion and a first half of the straight portion connected to
6 the first substantially rounded portion, and the second half part of the male interlocking
7 element comprised of the second substantially rounded portion and a second half of the
8 straight portion connected to the second substantially rounded portion.

1 18. A circuit board for mounting circuit components, the circuit board
2 comprising:
3 interconnecting means for electrically interconnecting the circuit
4 components mounted on the circuit board; and
5 female interlocking means for interlocking with male interlocking means
6 of a circuit board connector for mechanically connecting the circuit
7 board with another circuit board.

1 19. The circuit board of claim 18, further comprising:

2 through-hole means for mounting through-hole circuit components on the
3 circuit board, the interconnecting means electrically
4 interconnecting two or more of the through-hole circuit
5 components.

1 20. The circuit board of claim 18, further comprising:
2 surface-mount means for mounting a surface-mount circuit component on
3 the circuit board.

1 21. The circuit board of claim 18, further comprising:
2 surface-mount means for mounting a surface-mount circuit component on
3 the circuit board; and
4 through-hole means for mounting through-hole circuit components on the
5 circuit board, the interconnecting means electrically
6 interconnecting two or more of the surface-mount circuit
7 component and through-hole circuit components.

1 22. A circuit board connector for connecting a first circuit board with a second
2 circuit board, the first circuit board and the second circuit board for mounting circuit
3 components thereon and having at least a first female interlocking means and a second
4 female interlocking means, respectively, the circuit board connector comprising:
5 a body means for providing backing support for the connected first circuit
6 board and the second circuit board; and
7 male interlocking means connected to the body means, a first half part of
8 the male interlocking means capable of being inserted into the first

9 female interlocking means and a second half part of the male
10 interlocking means capable of being inserted into the second
11 female interlocking means to mechanically connect the first and
12 second circuit boards.

1 23. The circuit board connector of claim 22, wherein the first and second half
2 parts of the male interlocking means are capable of being inserted into the first and
3 second female interlocking means, respectively, from one side of the first and second
4 circuit boards to provide backing support for the connected first and second circuit
5 boards.

1 24. The circuit board connector of claim 22, comprising four male
2 interlocking means connected to the body means.

1 25. A method of forming a circuit board using a first circuit board, a second
2 circuit board, and a circuit board connector, the first circuit board having at least a first
3 female interlocking element, the second circuit board having at least a second female
4 interlocking element, and the circuit board connector having at least a male interlocking
5 element, the method comprising:

6 mounting at least a first circuit component on the first circuit board;
7 mounting at least a second circuit component on the second circuit board;
8 inserting a first half part of the male interlocking element into the first
9 female interlocking element; and

10 inserting a second half part of the male interlocking element into the
11 second female interlocking element to mechanically connect the
12 first and second circuit boards to form the circuit board.